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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/695,789

10/30/2003

Minish Mahendra Shah

D-20880-1

7750

7590 01/24/2008
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EXAMINER

BHAT, NINA NMN

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

01/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/695,789

Applicant(s)

SHAH, MINISH MAHENDRA

Examiner

N. Bhat

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10-30-2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

1. Applicant is requested to update the continuity data in the specification. On Page 1, line 1. Correction is required. The examiner acknowledges that this application is a Divisional application of 09/963,446, filed September 27, 2001, now US Patent 6,667,409. Claims pending are 18-20.
2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show stream 52 as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhasin et al. US Patent 6,765,101 in combination with Ramachandran et al., US Patent 5,117,225.

Bhasin et al. teach the invention as claimed which provides a method and apparatus for synthesizing alkylene oxides and alkylene glycols both of which are alkene derivatives as claimed by applicant from lower alkanes and/or lower alkenes. The apparatus includes means for introducing a lower alkane or alkene supply; an oxygen supply, a metal oxide catalytic reactor, which reacts the lower alkane/alkene supply with a source of oxygen to convert the lower alkane/alkene into a alkylene oxide and alkylene glycols; the apparatus includes separator equipment downstream from the reactor which selectively separates alkylene oxides and alkylene glycols from the produce stream and the unconverted reactants. Specifically Bhasin et al. teach that the process has been designed to produce ethylene oxide, ethylene glycol, propylene oxide, propylene glycol, and other lower alkylene oxides and lower alkylene glycols directly from lower alkanes and/or lower alkenes as the starting hydrocarbon raw materials, and specifically does this by eliminating the need for thermal crackers. [Note Column 1, lines 16 to

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Column 2, line 60 and Column 4, lines 41-63] The process includes reacting a lower alkane such as ethane to ethylene oxide and ethylene glycol by selective partial oxidation, the reactions are fully shown in Column 5, 6 and Column 8. From Figure 5, it can be seen that in reactor 16, there are input means for hydrogen which is optional, oxygen, lower alkane and/or alkene, the reactor includes a partial oxidation catalyst, which produces a product stream comprising alkylene oxides and/or glycols, water and unconverted reactants, is then separated in vessel 20 which permits unreacted alkanes and/or alkene and inerts to be recycled back into the reactor (16). The outlets from vessel (20) includes separate streams for carbon monoxide and carbon dioxide; a stream which includes predominately alkylene oxides, a water stream, an alkylene glycol stream and a bottoms stream which include heavier alkylene glycols.

However, Bhasin et al. do not teach specifically teach the cracking means to produce an alkene.

Ramachandran et al. teach a process for the production of alkylene oxides by the reaction of an alkene and an oxygen containing gas. Ramachandran et al. teach in Figure 3, the system wherein the alkene is converted into an alkylene oxide in which the oxidant can be selected from anyone one or more of pure oxygen, air and oxygen enriched air, specifically alkene and oxygen are delivered to oxidation reactor (54) to product an alkylene oxide, unreacted alkene, oxygen, carbon dioxide, nitrogen and argon if other than pure oxygen is used as the oxidation. The mixture is then cooled, and sent to a scrubber (58) wherein water is used to separate the alkylene oxide from the off gases, the alkylene oxides are removed from the scrubber. The off gases are then sent a pressure swing adsorber which contained two or more beds which removed carbon dioxide nitrogen and argon if present. From the adsorber a stream which contains substantially all of the unreacted alkylene and is recycled back to the oxidation reactor (54), this permits the other gases to be directed vented without incineration. Carbon

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dioxide can be removed as part of the vent gases and/or separated using conventionally technology such as using molecular sieves also by using a plurality of pressure swing adsorption columns, the carbon dioxide can be removed from the system. The means for separating and/or treating the undesirable components such as the carbon dioxide, the inert gases etc. have been taught by Ramachandran et al. in an ethylene oxide production system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made from reading Bhasin et al. and Ramachandran et al. to provide a system which integrates an alkene derivative system with a alkene system because, Bhasin et al. specifically teach that it is known and recognized to react an alkane and/or alkene to produce an alkylene oxide or alkylene derivative using a reactor which includes means for producing an alkene derivative from oxygen, means for discharging the alkene derivative to a product recover unit, the product recovery unit having means for purifying and/or separating the alkene derivative from the unconverted reactants including means for removing undesirable gases from the alkene or alkane stream. In Bhasin et al, there is a clear recognition in the art, selective oxidation reaction of ethane to produce ethylene oxide is possible without specifically using a thermal cracking unit, the reaction is shown as pointed out and described above, Bhasin et al. teaches though that either using an alkane or alkene is applicable in the process and therefore both the alkane or alkene are functionally equivalent starting materials for the production of an alkene derivative system and therefore to specifically integrate an alkene producing starting product which is conventionally made using thermal cracking which is admitted as being known in both applicant's specification and in the references of Bhasin et al. and even Ramachandran et al. renders applicant's invention as a whole obvious. It is the position taken by the examine that there is no invention in the apparatus by providing a reactor or cracker which inputs the starting material wherein the starting material has already been taught in systems as

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being functionally equivalent, and it is immaterial to the apparatus if the apparatus has an input stream, where the input stream comes from, i.e. there is not difference in the apparatus if a tank or source of ethylene is connected to the apparatus or the input source is directed connected to a thermal cracking unit. In other words, if ethylene is the starting material for making ethylene oxides it makes no difference to the artisan where the starting material comes from originally.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Baker et al. teach using selectively permeable membranes in ethylene oxide production systems which selectively removes ethylene over argon. Papavassiliou teach a method for producing ethylene oxide comprising feed ethylene, high purity oxygen into a reactor to produce ethylene oxide which is then separated from any unreacted streams which are further selectively separated. Gorcester teach a process for manufacturing ethylene oxide the ethylene oxide is then removed, the stream containing unreacted reactants are then compressed and then separated in a membrane using a carbon dioxide separation unit then any unused reactants are then recycled back into the ethylene oxide reactor. Tomizuka et al. teach a method for recovering ethylene from vent gas from ethylene oxide plant vent gas. Pendergast et al. teach ethylene recovery in direct oxidation ethylene oxide processes. Ozero et al. teach a process and system for producing ethylene oxide which includes selective extraction of carbon dioxide and argon from the ethylene oxide recycle stream. Pollock teach a thermal cracking unit for the production of alkenes. Busson et al. teach a process for thermal pyrolysis of a feedstock that contains ethane to produce ethylene. Vora et al. teach a process for enhancing the production of light olefins using a catalytic reactor.


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


N. Bhat
Primary Examiner
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